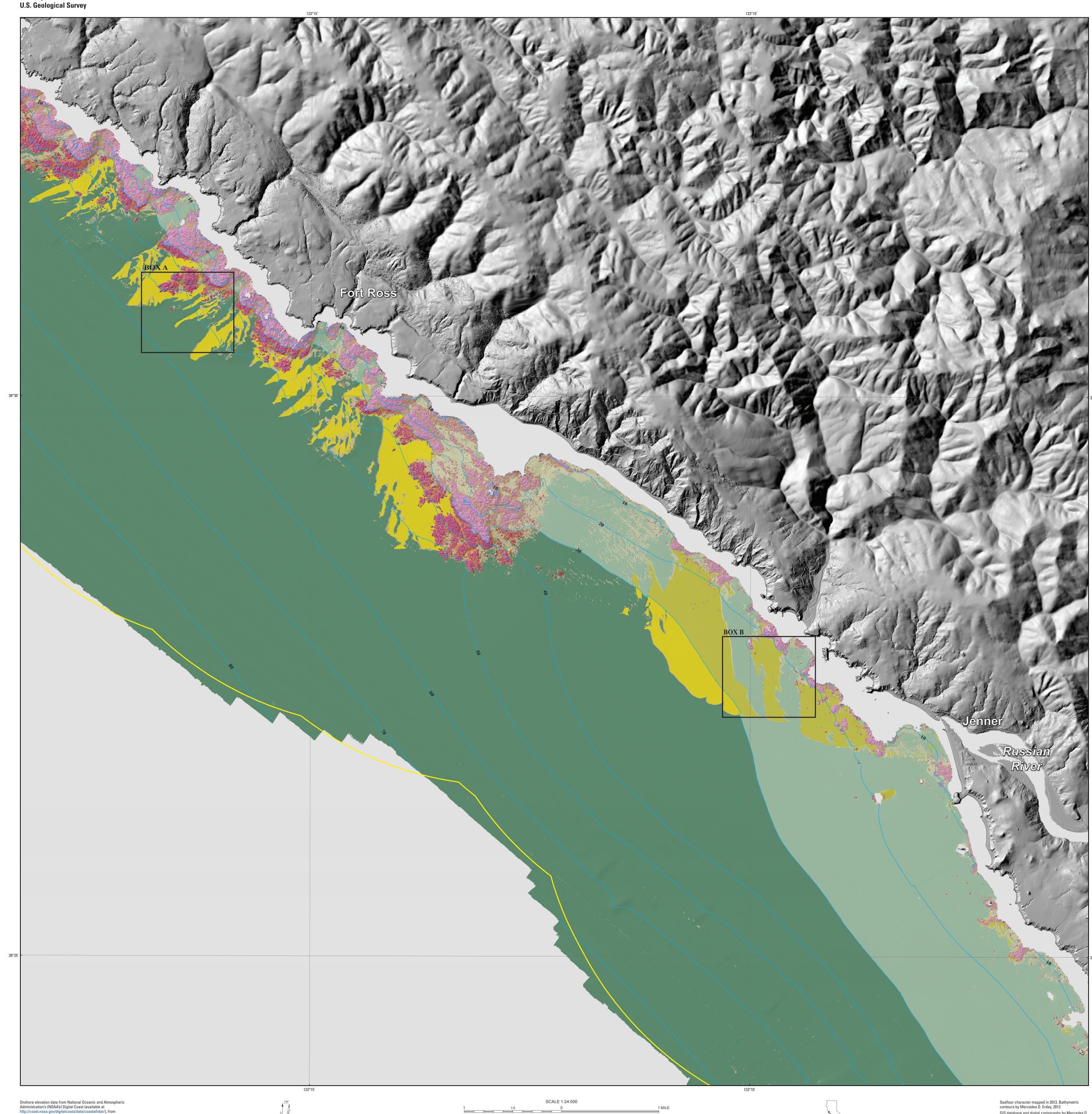
U.S. Department of the Interior

OpenTopography (available at http://www.opentopography.org/), and

from U.S. Geological Survey's National Elevation Dataset (available at

http://ned.usgs.gov/). Offshore shaded-relief bathymetry from map on sheet 2, this report. California's State Waters limit from NOAA Office

Universal Transverse Mercator projection, Zone 10N NOT INTENDED FOR NAVIGATIONAL USE Open-File Report 2015–1211



DESCRIPTION OF MAP UNITS

DEPTH ZONE 2—INTERTIDAL TO 30 METERS WATER DEPTH SLOPE CLASS 1—0 TO 5 DEGREES Fine- to medium-grained smooth sediment—Low backscatter, low rugosity; typically mud to medium-grained sand; often rippled and (or) burrowed Mixed smooth sediment and rock—Moderate to very high backscatter, low rugosity; typically coarse-grained sand, gravel, cobbles, and bedrock Rock and boulder, rugose—High backscatter, high rugosity; typically boulders and rugose bedrock

Medium- to coarse-grained sediment—Very high backscatter, low rugosity; typically medium- to coarse-grained sediment, with varying amounts of shell hash; in scour depressions SLOPE CLASS 2—5 TO 30 DEGREES

Fine- to medium-grained smooth sediment—Low backscatter, low rugosity; typically mud to medium-grained sand; often rippled and (or) burrowed Mixed smooth sediment and rock—Moderate to very high backscatter, low rugosity; typically coarsegrained sand, gravel, cobbles, and bedrock Rock and boulder, rugose—High backscatter, high rugosity; typically boulders and rugose bedrock

DEPTH ZONE 3—30 METERS TO 100 METERS WATER DEPTH

SLOPE CLASS 1—0 TO 5 DEGREES Fine- to medium-grained smooth sediment—Low backscatter, low rugosity; typically mud to medium-grained sand; often rippled and (or) burrowed Mixed smooth sediment and rock—Moderate to very high backscatter, low rugosity; typically coarse-grained sand, gravel, cobbles, and bedrock **Rock and boulder, rugose**—High backscatter, high rugosity; typically boulders and rugose bedrock Medium- to coarse-grained sediment—Very high backscatter, low rugosity; typically medium- to coarse-grained sediment, with varying amounts of shell hash; in scour depressions

SLOPE CLASS 2—5 TO 30 DEGREES Mixed smooth sediment and rock—Moderate to very high backscatter, low rugosity; typically coarsegrained sand, gravel, cobbles, and bedrock Rock and boulder, rugose—High backscatter, high rugosity; typically boulders and rugose bedrock

EXPLANATION OF MAP SYMBOLS

Area of "no data"—Areas near shoreline not mapped owing to insufficient high-resolution seafloor mapping data; areas beyond 3-nautical-mile limit of California's State Waters were not mapped as part of California Seafloor Mapping Program interval: 10 m - 3-nautical-mile limit of California's State Waters

DISCUSSION

This seafloor-character map of the Offshore of Fort Ross map area in northern California was produced using video-supervised, maximum-likelihood classification of the bathymetry and backscatter (intensity of return) signals from sonar systems (a summary of the video data collected for the purpose of supervising the classification is shown on sheet 6). Rugosity (a GIS-derived characterization of roughness) and backscatter intensity were used as variants in the classification. The interpreted classifications were then draped over shaded-relief bathymetry (see sheet 2). The substrate classes mapped in this area have been divided into the following California Marine Life Protection Act depth zones: Depth Zone 2 (intertidal to 30 m), and Depth Zone 3 (30 to 100 m). In addition, the following slope classes are represented on this map (Coastal and Marine Ecological Classification Standard slope zones are shown in parentheses): Slope Class 1, 0° to 5° (flat); and Slope Class 2, 5° to 30° (sloping). Depth Zone 1 (intertidal), Depth Zones 4 and 5 (greater than 100 m), and Slope Classes 3 to 5, greater than 30° (steeply sloping to overhang) are not present in this map area.

Figure 1. Detailed view of substrate classes mapped offshore of Fort Ross (see Box A, on map, for location): Depth

Zone 2 (intertidal to 30 m), Depth Zone 3 (30 to 100 m), Slope Class 1 (0°-5°), and Slope Class 2 (5°-30°). Fine- to

medium-grained smooth sediment is shown in shades of green; mixed smooth sediment and rock is shown in

shades of tan; rock is shown in shades of pink; and medium- to coarse- grained sediment is shown in shades of

rugose; Depth Zone 3, Slope Class 1

Fine- to medium-grained smooth sediment; Depth Zone 3, Slope Class 1

Rock and boulder,

sediment; Depth Zone 3,

rugose; Depth Zone 3,

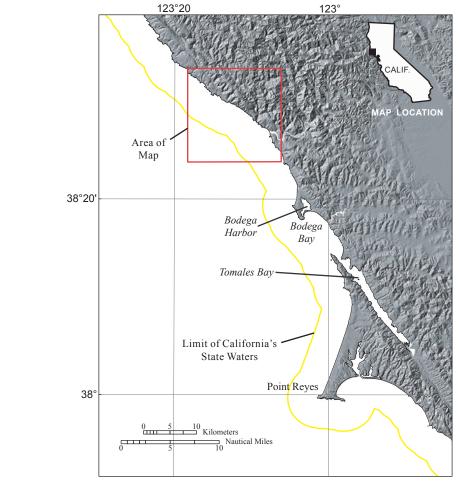
rugose; Depth Zone 3, Slope Class 1

GIS database and digital cartography by Mercedes D.

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yellow. Bathymetric contour (30 m) added for depth reference.



Fine- to medium-grained smooth sediment (sand and mud) makes up 84.0 percent (98.3 km²) of the map area: 19.4 km² is in Depth Zone 2, and 78.9 km² is in Depth Zone 3. Mixed smooth sediment (sand and gravel) and rock (that is, sediment typically forming a veneer over bedrock, or rock outcrops having little to no relief) make up 4.9 percent (5.7 km²) of the map area: 3.6 km² is in Depth Zone 2, and 2.1 km² is in Depth Zone 3. Rock and boulder, rugose (rock and boulder outcrops having high surficial complexity) makes up 5.0 percent (5.9 km²) of the map area: 4.0 km² is in Depth Zone 2, and 1.9 km² is in Depth Zone 3. Medium- to coarsegrained sediment (in scour depressions consisting of material that is coarser than the surrounding seafloor) makes up 6.1 percent (7.2 km2² of the map area: 2.9 km2² is in Depth Zone 2, and 4.3 km2² is in Depth Zone 3

Table 1. Coverage of classified seafloor, in square kilometers (sq km) and percent of total area, broken into California Marine Life Protection Act Depth Zones 2 and 3.

	Total		Depth Zone 2 (water depth 0-30 m)		Depth Zone 3 (water depth 30–100 m	
	percent	sq km	percent of total	sq km	percent of total	sq km
Fine- to medium- grained smooth sediment	84.0	98.3	16.6	19.4	67.4	78.9
Mixed smooth sediment and rock	4.9	5.7	3.1	3.6	1.8	2.1
Rock and boulder, rugose	5.0	5.9	3.4	4.0	1.6	1.9
Medium- to coarse- grained sediment	6.1	7.2	2.5	2.9	3.6	4.3









Pamphlet accompanies map

and rock; Depth Zone 2, Rock and boulder, rugose; Depth Zone 2, Slope Class 2 smooth sediment; Depth Zone 2, Slope Class 1 grained sediment;
Depth Zone 2, Slope Class 1

> Fine- to medium-grained smooth sediment; Depth Zone 3, Slope Class 1

Figure 4. Detailed view of substrate classes mapped in nearshore, northwest of Jenner (see Box B, on map, for location): Depth Zone 2 (intertidal to 30 m), Depth Zone 3 (30 to 100 m), Slope Class 1 (0°-5°), and Slope Class 2 (5°–30°). Fine- to medium-grained smooth sediment is shown in shades of green; mixed smooth sediment and rock is shown in shades of tan; rock is shown in shades of pink; and medium- to coarse- grained sediment is shown in

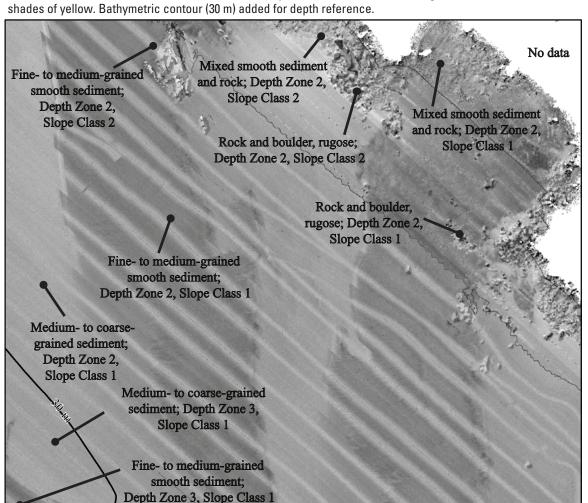


Figure 5. Acoustic-backscatter image (see sheet 3) draped over shaded-relief bathymetry (see sheet 2) for same area as figure 4 (Box B on map). Brighter areas indicate coarse-grained, rough, or hard seafloor; darker areas indicate unconsolidated (loosely packed) sediment. Northwest-southeast-trending lines are data-processing artifacts. Interpreted substrate classes from figure 4 included for comparison.

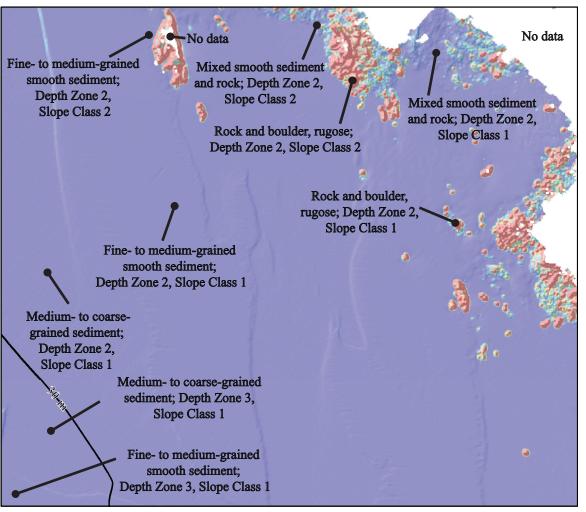


Figure 6. Rugosity (characterization of roughness derived from bathymetry) draped over shaded-relief bathymetry (see sheet 2) for same area as figure 4 (Box B on map). Rugosity values are displayed in muted "rainbow" color spectrum that ranges from purple (low rugosity) through green (medium rugosity) to red (high rugosity). Interpreted

substrate classes from figure 4 included for comparison.

sheets, scale 1:24,000, http://dx.doi.org/10.3133/ofr20151211.

Medium- to coarsegrained sediment; Fine- to medium-grained smooth sediment; Depth Zone 3,

Figure 2. Acoustic-backscatter image (see sheet 3) draped over shaded-relief bathymetry (see sheet 2) for same

area as figure 1 (Box A on map). Brighter areas indicate coarse-grained, rough, or hard seafloor; darker areas

indicate unconsolidated (loosely packed) sediment. Northwest-southeast-trending parallel lines are

data-processing artifacts. Interpreted substrate classes from figure 1 included for comparison.

Mixed smooth sediment and rock; Depth Zone 3,

Slope Class 1

Figure 3. Rugosity (characterization of roughness derived from bathymetry) draped over shaded-relief bathymetry (see sheet 2) for same area as figure 1 (Box A on map). Rugosity values are displayed in muted "rainbow" color spectrum that ranges from purple (low rugosity) through green (medium rugosity) to red (high rugosity). Interpreted substrate classes from figure 1 included for comparison.

BATHYMETRIC CONTOUR INTERVAL 10 METERS ONE MILE = 0.869 NAUTICAL MILES